Lithologic Log Addendum

Well ST-3-735

Cuttings of the lithologic unit from well ST-3-735 were sent to the Department of Geological Sciences, New Mexico State University (NMSU), Las Cruces, New Mexico, for detailed petrographic analysis when identification of fine-grained, highly altered volcanic rocks at the NASA-WSTF site became difficult using conventional field methods. Petrographic reports from NMSU were received after the printing of these lithologic logs, hence the need for this addendum. The petrographic description from NMSU is included below.

Previous unit name based on field identification: **Tuff**

New Unit name based on petrographic analysis: **Andesite**

ST-3-735 (600' - 610)

Porphyritic biotite-augite andesite

Origin:	lava flow
Texture:	aphanitic porphyritic
Phenocryst mineralogy:	plagioclase + augite + biotite + FeTi oxides
Porosity:	5% vesicles
Alteration:	minimal

This sample is very similar to ST-1-630 (695' - 700') and ST-3-666 (695' - 700') except that is much less altered. It is aphanitic porphyritic with phenocrysts of plagioclase, augite, biotite, and FeTi oxides in a groundmass of plagioclase, augite, and oxides. Approximately 7% phenocrysts are surrounded by an intersertal to trachytic groundmass dominated by plagioclase and oxides. Plagioclase phenocrysts (3%, 0.1 - 1.4 mm) are zoned and resorbed, with euhedral clear rims. Augite phenocrysts (3%, 0.34 - 1.4 mm) are twinned and euhedral. Biotite phenocrysts (0.5%, 1 - 1.4 mm) are oxidized and exhibit yellow to red-brown pleochroism. FeTi oxides (0.5%, 0.3 - 0.45 mm) are present as microphenocrysts. Apatite (0.1 mm) exists in trace amounts within augite and plagioclase phenocrysts. A trace of quartz is present, in contact with augite, and is rounded and embayed. The rock contains 5% vesicles. This sample is much fresher than other examples of this lithology, and lacks the calcite veins. This sample originated as an andesitic lava flow.

ST-3-735 (803')

Porphyritic biotite-augite andesite

Origin:	lava flow
Texture:	aphanitic porphyritic

Lithologic Log Addendum

Well ST-3-735 (cont'd)

Phenocryst mineralogy:	plagioclase + augite + biotite
Porosity:	low, except along calcite veins
Alteration:	low, except for calcite veins and oxidation of biotite

This sample is similar to the other samples labelled ST-3. It contains 7% phenocrysts of plagioclase (3%), augite (3%), biotite (1%), with trace amounts of apatite and FeTi oxides in an intergranular groundmass of plagioclase, augite, and oxides. Primary porosity is very low to zero, but porosity along veins is moderate to high. Alteration consists largely of veins of calcite and oxidation of biotite, and is moderate in extent. The sample originated as a lava flow.